

1. Which of the following is the correct updated rule for replacing the nonterminal S after the $A \rightarrow \varepsilon$ rule is removed from the following CFG: $S \rightarrow AS|bA$, $A \rightarrow B|\varepsilon$, $B \rightarrow b$?

(3 points)

- A. $S \rightarrow AS | bA | A$
- B. $S \rightarrow AS | b$
- C. $S \rightarrow S | b$
- ✓ D. $S \rightarrow AS | S | bA | b$

2. Which of the following is the correct updated rule for replacing the nonterminal S after the $B \rightarrow \epsilon$ rule is removed from the following CFG: $S \rightarrow ASB|BAB, B \rightarrow b|\epsilon, A \rightarrow Aa|\epsilon$?

(3 points)

- ✓ A. $S \rightarrow ASB | BAB | AS | AB | BA | A$
- B. $S \rightarrow ASB | BAB | AS | AB | BA$
- C. $S \rightarrow ASB | BAB | AB | BA$
- D. $S \rightarrow ASB | BAB | AS | S | AB | BA$

3. Which of the following is the correct conversion of the grammar rule $S \rightarrow SAA | bA$ to CNF?

(3 points)

- A. $S \rightarrow A_1A|BA, A_1 \rightarrow AS, B \rightarrow b$
- B. $S \rightarrow A_1A|bA, A_1 \rightarrow AS$
- ✓ C. $S \rightarrow A_1A|BA, A_1 \rightarrow SA, B \rightarrow b$
- D. $S \rightarrow A_1|AB, A_1 \rightarrow SA, B \rightarrow b$